source, for example a pressurized gas cylinder, independent of said pressurized gas source feeding said spray nozzle, and a pressure and flow limiter is arranged between said reservoir and said spray nozzle; or alternatively still

[0022] the lubricating and cooling liquid contained in said reservoir is pressurized by a pump the outlet of which is connected to said reservoir by a bypass comprising a calibrated valve that opens as soon as the outlet pressure of said pump becomes higher than said feed pressure of the spray nozzle.

[0023] It is also noted that, because the reservoir of the auxiliary backup device is independent of the main device, it is easy and advantageous for said reservoir to be arranged some distance away from said mechanical assembly so that said lubricating and cooling liquid it contains does not experience the effect of the heat given off by said mechanical assembly.

[0024] Thermal degradation of the liquid contained in said reservoir is thus avoided.

[0025] When the system according to the present invention comprises a number of spray nozzles, these may be fed with pressurized gas and with lubricating and cooling liquid through a splitter.

[0026] In addition, these nozzles may be split into groups and all the nozzles in one group may be fed with pressurized gas and with lubricating and cooling liquid by a common feed device, all said common feed devices themselves being fed with pressurized gas and with lubricating and cooling liquid by said splitter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The figures of the appended drawing will make it easy to understand how the invention may be achieved. In these figures, identical references denote similar elements.

[0028] **FIG. 1** schematically illustrates a lubricating and cooling system according to the present invention.

[0029] **FIGS. 2 and 3** depict, in views similar to **FIG. 1**, alternative forms of embodiment of the lubricating and cooling system according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0030] **FIG. 1** schematically depicts the main transmission gearbox **1** of a helicopter (not depicted) and its lubricating and cooling system **2**, **3**.

[0031] This lubricating and cooling system comprises a main device **2** circulating through said main transmission gearbox **1** a stream of main lubricating and cooling liquid, essentially oil or some similar liquid. This main device comprises a closed-loop circuit **4** through which said main liquid circulates under the action of a pump **5**. The circuit **4** introduces said main liquid at **6** into the main transmission gearbox **1** and, having lubricated and cooled the internal components of said main transmission gearbox (these components are not depicted), this main liquid is collected at **7** by said circuit **4**. After filtering at **8**, the main liquid thus collected is returned to a tank **9**, from which it is once again circulated through the circuit **4** by the pump **5**. The latter imparts to said main liquid a pressure generally of the order of around 10 bar.

[0032] The lubricating and cooling system additionally comprises an auxiliary backup device **3** set in operation when said main device **2** becomes defective, so as temporarily to maintain lubrication and cooling of the internal components of the main transmission gearbox **1** and thus prevent the latter from becoming damaged or even destroyed.

[0033] The auxiliary backup device **3** comprises a reservoir **10** of backup lubricating and cooling liquid, completely independent of the main device **2**, that is to say that the reservoir **10** has no hydraulic connection with the circuit **4**. The backup liquid (oil or similar product) contained in the reservoir **10** is pressurized by compressed air from a compressor stage **11** of the engine (not depicted) of the helicopter. This compressed air is sent to the reservoir **10** through a filter **12**, a control valve **13** which is normally closed, for example of the electrically operated valve type, a cooler **14** and a connection **10**A between the outlet of the latter and said reservoir **10**. The cooler **14** may be of the heat exchanger type.

[0034] In addition, the reservoir **10** is preferably arranged some distance away from the main transmission gearbox **1** so that the backup lubricating and cooling liquid it contains does not experience the effect of the heat given off by said main transmission gearbox.

[0035] Furthermore, the auxiliary backup device **3** comprises groups **15**, **16** of spray nozzles **17**, **18**, for example mounted on the housing **19** of the main transmission gearbox **1**. The spray nozzles **17**, **18** of the groups **15**, **16** are of a known type which, fed with pressurized gas and with liquid that is to be sprayed, are able to spray said liquid in the form of a mist. In consequence, each spray nozzle **17** of the group **15** is connected, by a double connection (pressurized gas/liquid for spraying), to a feed device **20** able to deliver pressurized gas and liquid for spraying. Likewise, each spray nozzle **18** of the group **16** is connected, by a double connection (pressurized gas/liquid for spraying), to a feed device **21** able to deliver pressurized gas and liquid for spraying. In addition, the feed devices **20**, **21** may themselves be fed with pressurized gas and with liquid for spraying from a splitter **22**.

[0036] This splitter **22** may receive compressed air from the compressor stage **11**, by virtue of a connection with the outlet of the cooler **14**, via a nonreturn valve **23** and a filter **24**. Likewise, the splitter **22** may receive backup lubricating and cooling liquid by virtue of a connection with the reservoir **10**, via a pressure and flow limiter **25**, a nonreturn valve **26** and a filter **27**. Such a pressure and flow limiter **25** may consist of a calibrated pressure relief valve.

[0037] The control valve **13** may be opened manually using a member **28**, for example available to the helicopter pilot, or via a pressure sensor **29** arranged in the circuit **4**.

[0038] Thus, when the main circuit **2** becomes defective, for example following a breakdown of the pump **5** or a leak from the circuit **4**, the pressure of the main lubricating and cooling liquid in said circuit **4** decreases very rapidly. The drop in pressure is detected by the sensor **29**, which either is connected to an alarm (not depicted) alerting the pilot who